

Parabolic Trough Concentrator Development



USA Trough

Third Annual Parabolic Trough Workshop

June 18, 2000

By

Duke Solar Energy LLC

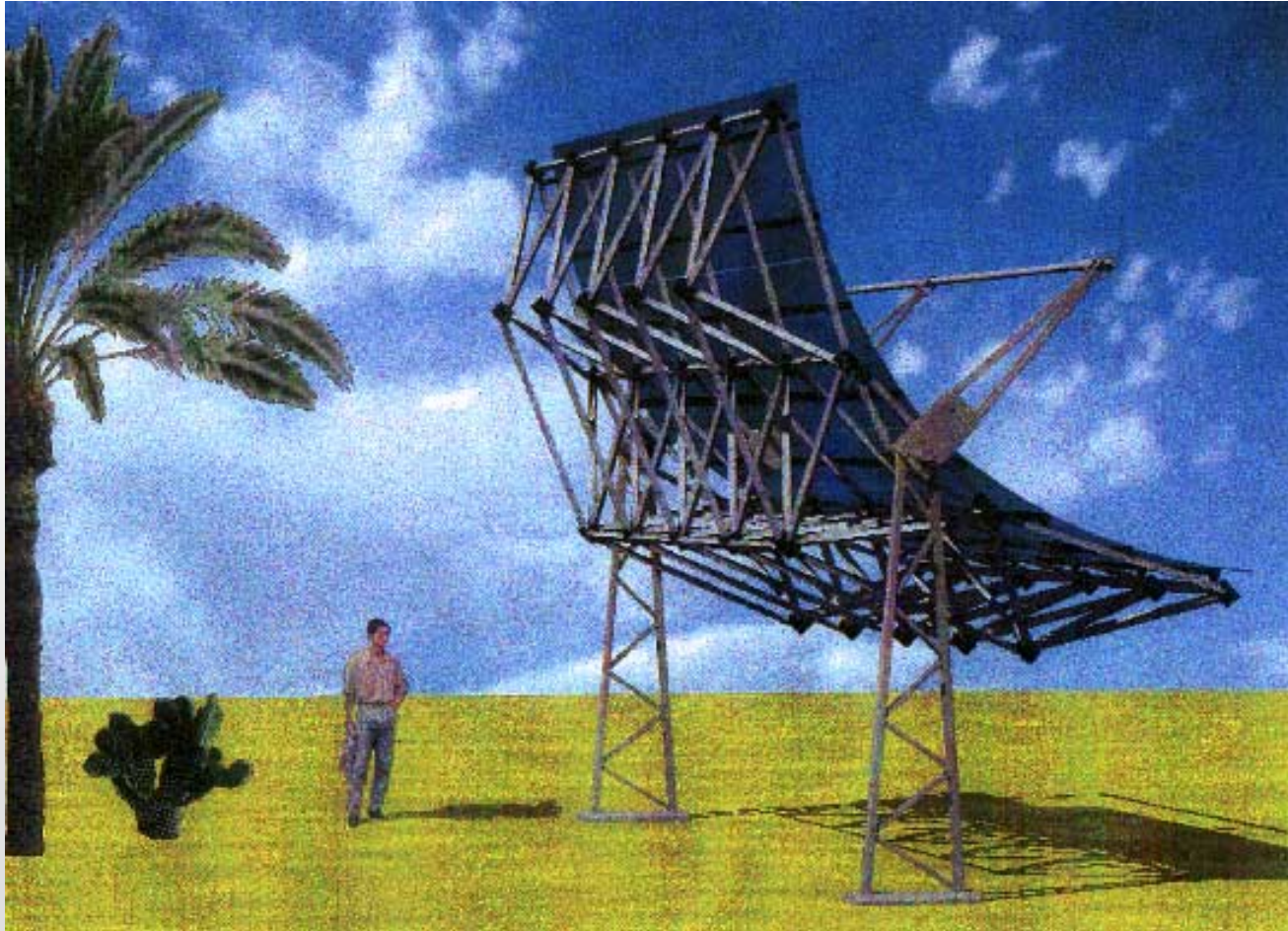
Gilbert Cohen

Randy Gee

Roland Winston

David Kearney

Duke Solar Space Frame (Concept)



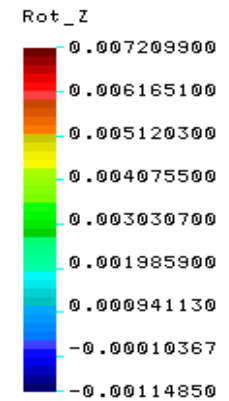
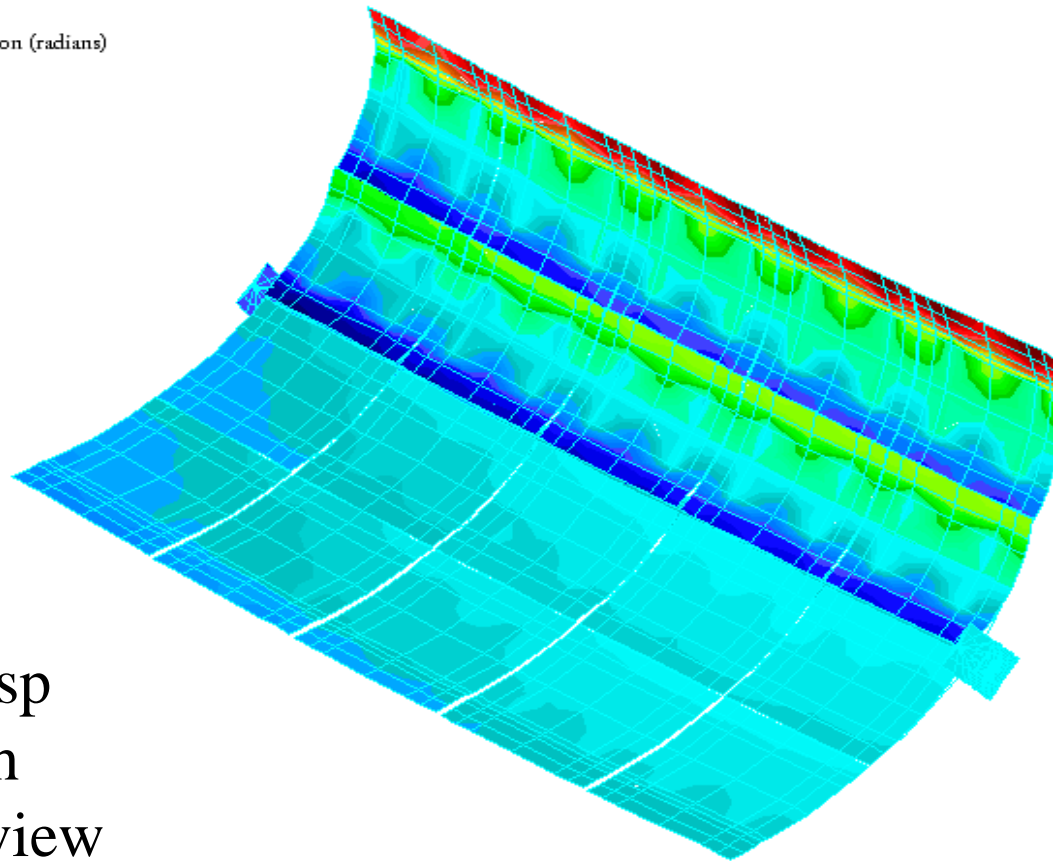
Duke Solar Space Frame

- Aluminum Struts and GeoHubs
- Increased Rigidity Via Interlinking
- No Site Cutting or Welding
- No jig necessary for assembly
- Components Easier to Handle and Ship
- Weight Incl. Mirrors ~ 22 Kg/m²

LS-2 Rotations in 37 Mph Wind

Lin DISP Lc=1

32 mph, Rotation (radians)
Front View



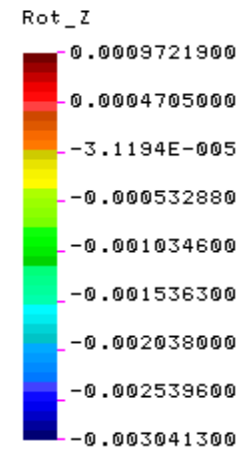
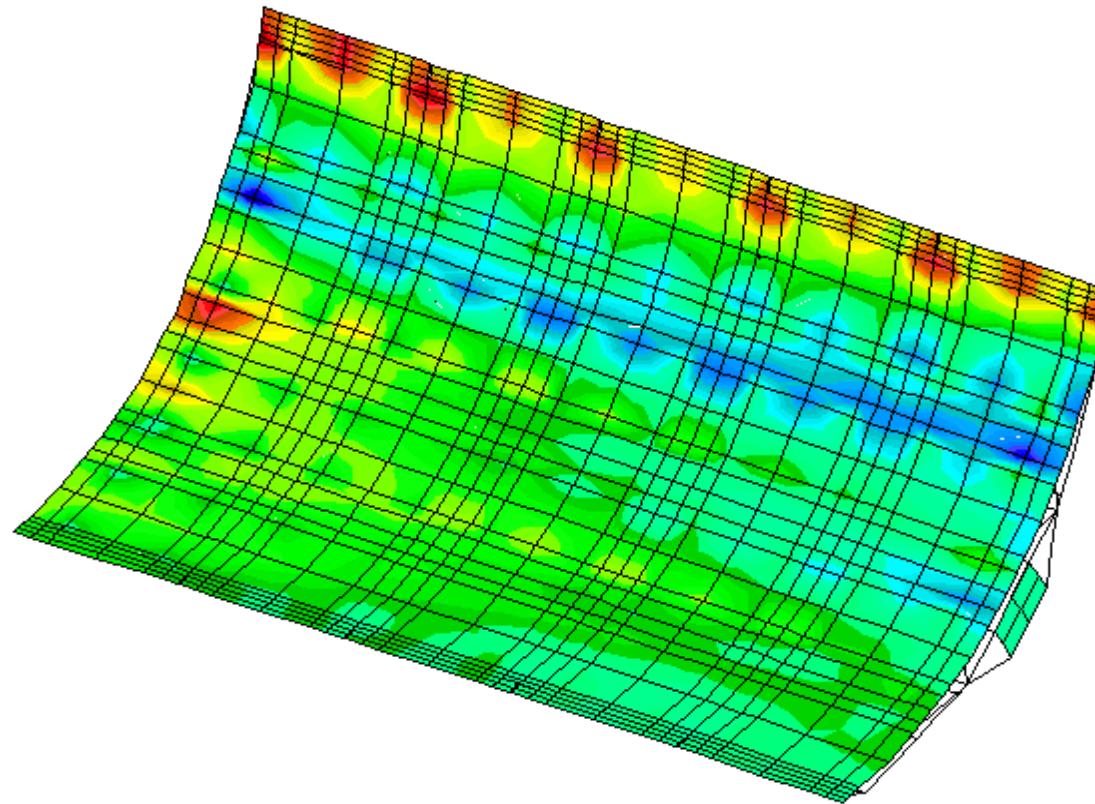
Lin Disp
32 mph
Front view

Duke Solar Space Frame



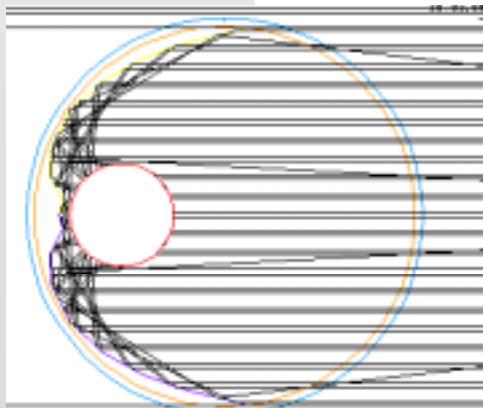
Rotations in 37 Mph Wind

Lin DISP Lc=1
32/38 mph
Rotation (radians)

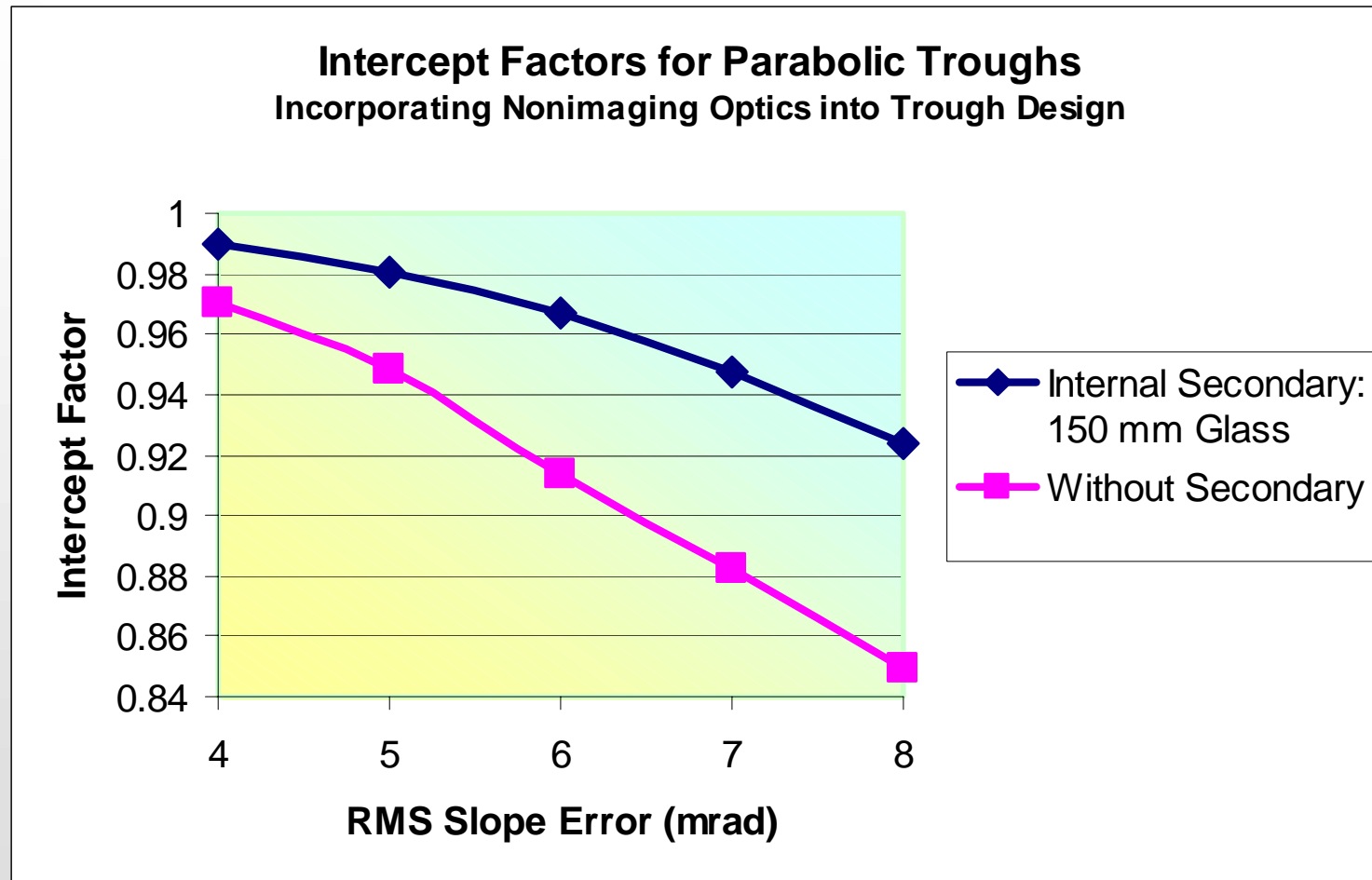


Secondary Reflector Advantages

- Increases Tolerance to Tracking Error
- Improves Flux Uniformity
- Allows Smaller Absorber Diameters
- Greatly Relaxes Optical Accuracy Req'd



Secondary Reflector – Accuracy Req'd



SOLEL VAC 300

APPLICATIONS

- Small scale solar electric generating systems (few KW and higher).
- Air conditioning and cooling.
- Cogeneration.
- Desalination.
- Steam generation.

Solel - Industrial Collector - 150 - 300 C



7/12/00

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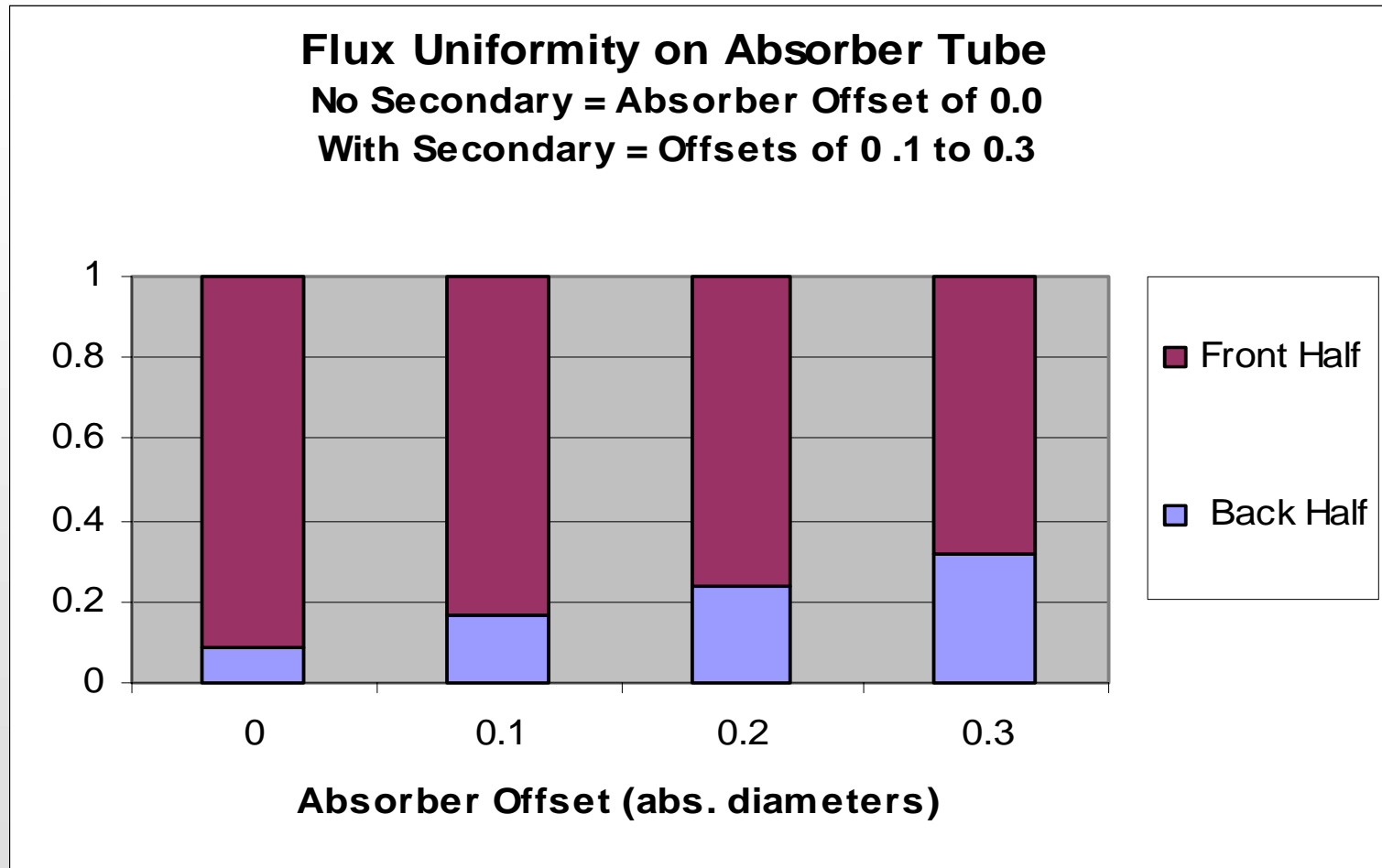


Solel - Industrial Collector - 150 - 300 C



7/12/00

Secondary Reflectors – Flux Uniformity



Secondary Reflectors for Troughs

